Report Date: 30 Jun 2014

Summary Report for Individual Task
551-88L-2058
Maintain an Electrical Distribution System
Status: Approved

Condition: Given an operational electrical distribution system aboard a vessel, at sea, at anchor or moored alongside a pier, day or night, under all sea and weather conditions, while wearing appropriate PPE, (i.e. hearing protection, Nitrile gloves, eye protection, etc .), lock out tag out kit, electrician's tool kit, and a marine rail tool box.

Standard: The Soldier correctly maintains an electrical distribution system aboard an Army vessel, IAW the appropriate Technical Manual and local SOP's without injury to self or others and without damage to equipment. The electrical distribution system was fully mission capable at task completion.

Special Condition: None

Safety Risk: High

MOPP 4:

Task Statements

Cue: None

DANGER

None

WARNING

None

CAUTION

None

Remarks: None

Notes: None

Performance Steps

1. Demonstrate basic knowledge of an electrical distribution system components.

a. Main Switchboard

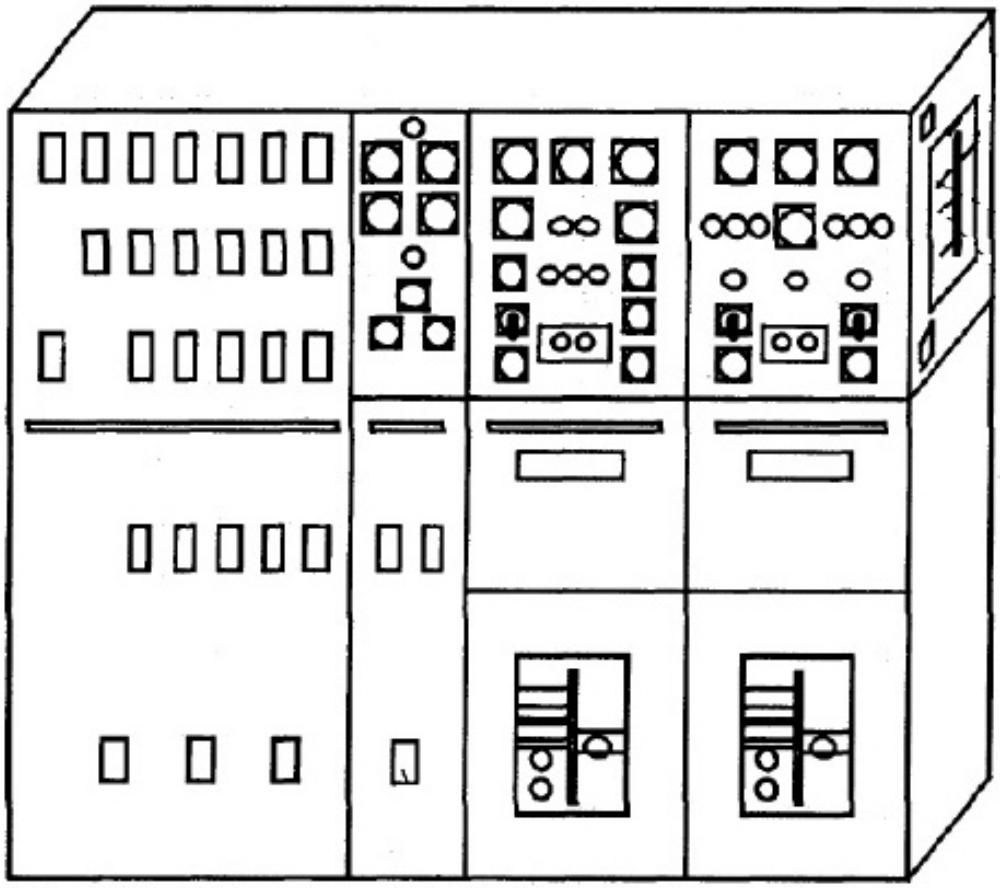
(1) The main switchboard is located in the EOS and provides the generator selection, shore power selection, and power distribution for the ship’s service.

(2) The main switchboard consists of transformers, as well as ammeters, voltmeters, kilowatt meters, frequency meters, a phase rotation meter, and a synchronization meter that provides power monitoring.

(3) Controls are provided for the automatic generator voltage regulation and the generator engine speed regulation.

(4) The switchboard motorized bus tie breaker also serves as an emergency power feedback source for the main switchboard from the emergency switchboard to power the selected equipment systems during emergency power conditions.

(5) An interlock system is incorporated into the switchboard to prevent damage to the switchboard by not allowing power from two sources to be supplied at the same time.



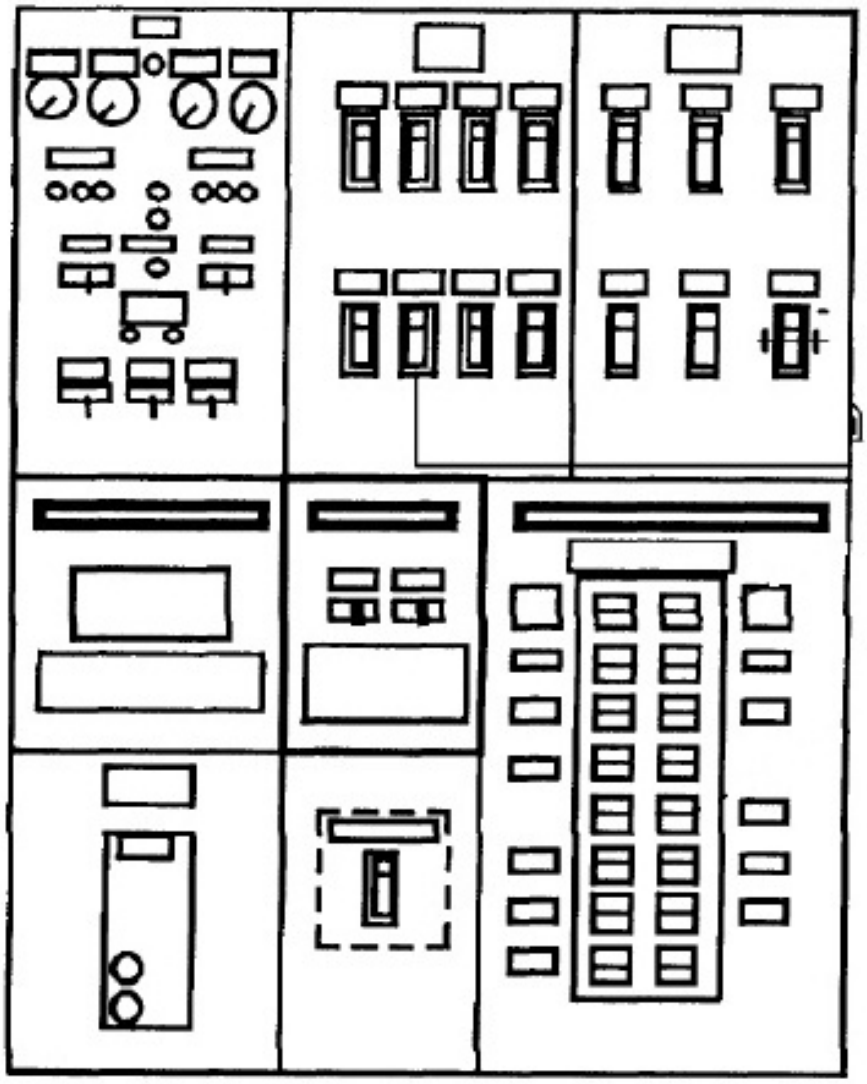
Main Switchboard
Figure 551-88L-2058_01

b. Emergency Switchboard

(1) The emergency switchboard is located in the emergency generator room and normally receives primary power from the main switchboard through the bus tie.

(2) Upon loss of the ship's service power from the main switchboard, a bus tie transfer breaker located within the emergency switchboard isolates the emergency switchboard and provides automatic or manual starting of the emergency generator.

(3) A voltmeter, ammeter, and a frequency meter provide the power monitoring capability.



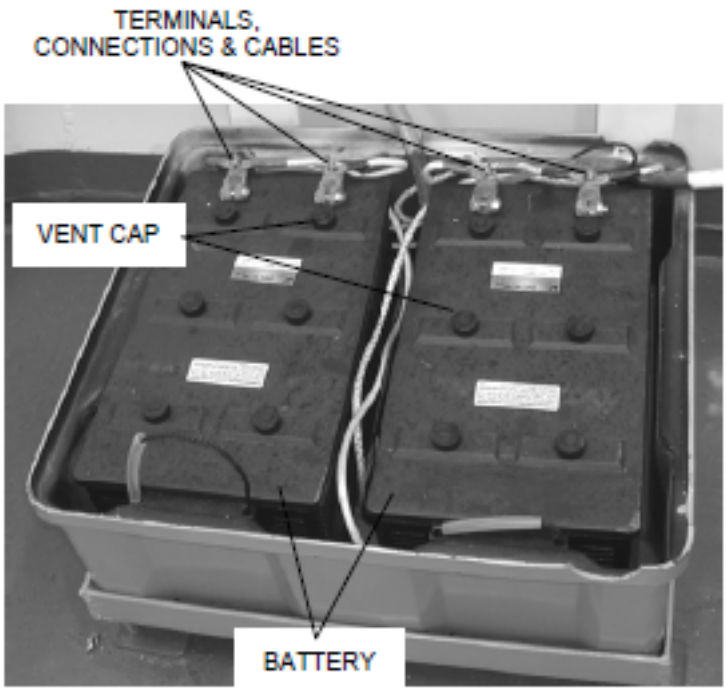
Emergency Switchboard
Figure 551-88L-2058_02

c. Storage Batteries

(1) Independent 24 Vdc battery banks are provided.

(2) One set of batteries provides starting power for the EDG engine.

(3) The second set provides starting power for SSDG 1.



Storage Batteries
Figure 551-88L-2058_03

(4) Check that the batteries and battery box lids are securely fitted. Secure as required.

d. Battery Chargers

(1) Battery chargers for each battery bank are provided.

(2) The battery chargers are supplied 120 Vac from the emergency load center distribution panel for the emergency switchboard.

(3) One charger is for the SSDG 1, and the other charger is for the machinery plant monitoring system and engine control.

LaMarche Battery Charger
Figure 551-88L-2058_04

e. Distribution Panels

(1) There are distribution panels located throughout the vessel that are provided for Vdc electrical system operation.

(2) The distribution panels house the circuit breakers and the fuses that control and protect the circuits throughout the vessel.

Distribution Panel
Figure 551-88L-2058_05

2. Maintain an electrical distribution system aboard a vessel.

Note: Electrical wiring checks and services consist of visual inspections only. Observe all CAUTION and WARNING labels on electrical equipment.

a. Main Switchboard

(1) Inspect the switchboard for secure mounting.

(2) Visually inspect the switchboard surfaces for damage.

(3) Check to confirm that compartment mechanical indicating devices and interlocks are functioning correctly.

(4) Clean the interior of the upper and lower compartments. Use a vacuum cleaner and clean rags only. Do not use steel wool or oxide papers. Blowing with compressed air is not recommended.

(5) Check primary disconnecting device contacts for signs of abnormal wear or overheating. Discoloration of the silvered surfaces is not ordinarily harmful. Wipe clean contacts using a lint free cloth.

(6) Before replacing breaker, check the alignment and wipe off the primary disconnecting device contacts. Apply a thin coat of contact lubricant to the house studs and fingers and to the primary disconnects on the breaker.

(7) Inspect the buses and connections carefully for evidence of overheating or weakening of insulation supports.

(8) Check all connection bolts to bus and all bus mountings and bolts for tightness.

(9) Wipe and vacuum clean the buses and supports.

(10) Inspect all main cable connections for signs of overheating.

(11) Check the main cable connections for tightness.

(12) Check all bolts that hold cable terminals to connection bars for tightness.

(13) Check that all secondary control wiring connections are tight and that all control cabling is intact.

b. Emergency Switchboard

WARNING

Electrical wiring, panels, and components contain high voltages that can cause severe injury or death.

(1) Check to confirm that all breaker and instrument compartment latches, and mechanical indicating devices and interlocks are operating correctly.

WARNING

Before attempting any maintenance, ensure that the power supply has been disconnected and locked out against unauthorized accidental start-up or else death or bodily injury due to electric shock could occur.

(2) Operate each circuit breaker and check all functions.

(3) Check the interior of the upper and lower compartments for contamination. Clean as required.

(a) When cleaning is required, use a vacuum cleaner and clean rags only.

(b) Do not use steel wool or oxide papers.

(c) Blowing with compressed air is not recommended.

(4) Check to confirm the instrumentation (voltmeter, ammeter, etc.) is functioning correctly.

(5) Check to confirm that all indicator lights are operating correctly.

(6) Inspect the switchboard for secure mounting.

(7) Visually inspect the switchboard surfaces for damage.

c. Storage Batteries

(1) Check the electrolyte level and specific gravity of electrolyte with a hydrometer.

(2) Inspect batteries, terminals, connections, cables, and vent caps for cleanliness and tightness.

(3) Clean the terminal connections as required. Clean the battery as required using a paste of clear water and baking soda. Rinse with clear water.

d. Battery Chargers

(1) Regularly check all connections from the battery throughout the entire electrical system.

(2) Ensure the battery chargers are on and charging the battery bank.

(3) Check the charger voltage and current operation.

(4) Measure the float charge voltage at the battery terminals and the float charge current.

e. Distribution Panels

(1) Check to confirm that all breaker and instrument compartment latches operate correctly.

(2) Operate each circuit breaker and check all the functions. This is particularly important for breakers that normally remain in either the opened or closed position for long periods.

(Asterisks indicates a leader performance step.)

Evaluation Guidance: None

Evaluation Preparation: None

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Demonstrated basic knowledge of an electrical distribution system components.			
a. Main Switchboard			
b. Emergency Switchboard			
c. Storage Batteries			
d. Battery Chargers			
e. Distribution Panels			
2. Maintained an electrical distribution system aboard a vessel.			
a. Main Switchboard			
b. Emergency Switchboard			
c. Storage Batteries			
d. Battery Chargers			
e. Distribution Panels			

Supporting Reference(s): None

Environment: Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to FM 3-34.5 Environmental Considerations and GTA 05-08-002 ENVIRONMENTAL-RELATED RISK ASSESSMENT.

Safety: In a training environment, leaders must perform a risk assessment in accordance with ATP 5-19, Risk Management. Leaders will complete the current Deliberate Risk Assessment Worksheet in accordance with the TRADOC Safety Officer during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW FM 3-11.4, Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection, FM 3-11.5, Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination.

Prerequisite Individual Tasks : None

Supporting Individual Tasks : None

Supported Individual Tasks :

Task Number	Title	Proponent	Status
551-88L-2039	Conduct The Engine Room Watch	551 - Transportation (Individual)	Approved

Supported Collective Tasks : None

ICTL Data :

ICTL Title	Personnel Type	MOS Data
88L30 Watercraft Engineer	Enlisted	MOS: 88L, Skill Level: SL3, Duty Pos: TFR, LIC: EN
88L40 Watercraft Engineer	Enlisted	MOS: 88L, Skill Level: SL4, Duty Pos: TGB, LIC: EN, SQI: O
88L20 Watercraft Engineer	Enlisted	MOS: 88L, Skill Level: SL2, Duty Pos: TFS, LIC: EN